
GENERAL VIEW
OF THE
AGRICULTURE
OF
ANGUS OR FORFAR.



2

GENERAL VIEW

OF THE

AGRICULTURE

OF THE COUNTY OF

ANGUS OR FORTHAR:

BY THE REV. MR. ROGER.

DRAWN UP, UNDER THE DIRECTION OF GEORGE DEMPSTER, ESQ. OF
DUNNICHEN;

FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE AND INTER-
NAL IMPROVEMENT.

N. Academic etc



EDINBURGH:

PRINTED BY JOHN PATERSON.

MDCCXCIV.

✓



A D V E R T I S E M E N T.

THE following communication, respecting the present state of husbandry in the county of Angus, and the means of its improvement, drawn up for the consideration of the Board of Agriculture, is now printed, merely for the purpose of its being circulated there, in order that every person, interested in the welfare of that county, may have it in his power to examine it fully before it is published. It is therefore requested, that any remark, or additional observation, which may occur to the reader, on the perusal of the following sheets, may be transmitted to the Board of Agriculture, at its office in London, by whom the same will be properly attended to; and, when the returns are completed, an account will be drawn up of the state of agriculture in Forfarshire, from the information thus accumulated; which, it is believed, will be found greatly superior to any thing of the kind, ever yet made public.

The Board is following the same plan, in regard to all the other counties in the United Kingdom; and, it is hardly necessary to add, will be happy to give every assistance in its power, to any person who may be desirous of improving his breed of cattle, sheep, &c. or of trying any useful experiment in husbandry.

PRELIMINARY OBSERVATIONS

BY

GEORGE DEMPSTER, *Esq.* of DUNNICHEN.

ON THE IMPROVABILITY OF THE COUNTY OF FORFAR.

THE following observations, are founded on the facts collected by Mr. Roger, who, to render his survey as perfect as possible, visited every part of the County, and conversed with some of the most intelligent persons in each parish. With but very few exceptions, he found every body ready to forward the enquiries of the Honourable Board of Agriculture, which they saw had so strong a tendency to promote the peculiar interests of the husbandman, and the general improvement of the country.

There are in the county of Angus, according to his calculations, 467,415 Scotch, (equal to 550,998 English acres).

Of the above quantity of Scotch acres, there are,

In Tillage, and pasture,	397,829
In Plantation, (mostly Scotch fir)	12,086
Of Moorish pasture,	17,500
Of Mountainous or Waste lands,	40,000

Total 467,415
The

The 397,829 acres which may be called arable, employ about 2872 ploughs; whereof about 50 may be drawn by oxen. Thus, for every 137 of arable acres, only one plough is used.

It is necessary to observe, that all over Scotland, the arable land is of two kinds, *out-field* and *in-field*. In a farm of 100 acres, 20 or 25 acres formed the usual proportion of *in-field*; and on this was bestowed the whole manure. It was under perpetual crops; the year of dunging, it bore barley; and afterwards oats, for 2, sometimes 3 years.

The *out-field*, after remaining in natural grass, and being pastured 5 or 6 years, bore oats for three years, and was then left out again for pasture. This yielded scanty crops. It often hardly produced the third return.

The chief improvement already made in this county, has been on this *out-field*, and there can hardly be a better subject. For when inclosed, and limed with 30 bolls of unslacked lime-stone, or 90 flacked, which cost about 2s. 6d. per boll, or L. 3:15 in all; or covered with 60 bolls, or 480 cubic feet, of shell-marle, costing L. 2, and then dressed with its proportion of the dung of the farm, it soon becomes very fertile. The *out-field* and *in-field* being both treated alike, and laid out in green crops of grass, turnip, and potatoes, the general produce of the farm is greatly increased. Thus, a farm of 100 acres, which was reckoned high-rented at 15s, for the *in-field*, amounting perhaps to 25 acres, and 5s for the *outfield* of 75 acres, in all L. 37:10, when treated in the manner above-mentioned, became a better bargain at 15s per acre over all, or L. 75; which forms an increased rent of L. 37:10, which is double the former rent. Such are the returns, also, after lime and marle, that their expence is reimbursed, to a careful farmer, by the first 3 or 4 crops they yield*.

A

* A gentleman of Forfarshire, endeavouring to give a plain English farmer an idea of

A farm of 100 acres, according to the new culture, requires two ploughs; that is, a plough to every fifty acres. But at present there is but one plough, at an average of the county, to 137 acres.

Forfarshire, therefore, when in a state of full improvement, might employ nearly 5084 more ploughs than it now does; each plough requiring an additional ploughman, whereof one half would at least be married men with families. This would make an addition of 2,542 families, or 12,910 inhabitants of the most valuable sort. Every acre of land, under the new culture, would yield a rent of 15s.; the whole 397,829 would consequently yield L. 272,621. The present rent being now about L. 90,000, the improved rents would be L. 182,621; or nearly thrice as great as the present rent; and in the opinion of the writer of these observations, the rents of the county have already been doubled within these last 50 years, a period which does not extend beyond his memory.

It is to be observed, that nothing here is set down, for the additional rents of waste land, nor for the produce of the 12,000 acres in plantations. The conveniency however arising from the wood, which it is necessary to sell, in order to thin these plantations, is very great to all our farmers, and not unprofitable to the planter.

It is also within the memory of the writer, that the farm-houses and offices were wretched hovels, made frequently with stone and turf alternately, and covered with turf, and a film of straw, bound down by straw ropes: That the farmer and all his family were clothed in coarse blue rags: That at the end of the winter, but more especially, at the close of the seed-time, every horse and ox employed on the farm, were,

a 2

by

of *out-field*, was very long before he could accomplish the point. At last the farmer said, "I think I now understand you; *out-field*, must certainly mean land that the "tenant has no use for."

by hunger and hard work, worn to mere skeletons. It was not uncommon, to find the cows, oxen, and calves, at the *lifting*, that is to say, on the return of the grass, it was necessary to *lift* them upon their legs, and help them out to the grass fields. The cows yielded little or no milk. The calves and foals being stunted by hunger, rose neither to strength, size, nor beauty. Horses sold then from L. 3 to L. 7, oxen at L. 3 or 4, cows at L. 2 or 3.

Whereas, now, by means of the increased produce of the farms, of hay, and potatoes, and turnip, farm horses are worth from L. 15 to L. 30, oxen from L. 5 to L. 14, cows from L. 5 to L. 9 and L. 10; and the working cattle, appear equally fat and hearty throughout the whole year.

The farm houses and offices are also much improved. They are built of stone and clay, covered with slate, or substantially thatched, and form a square court, with a straw yard in the centre, producing a great quantity of manure for the farm.

The farther means of improving this county, by increasing the plantations, are obvious and immense, more especially, if larches were to be substituted in the room of our Scotch firs. These are infinitely preferable in every respect. They grow twice as fast, on worse and higher ground, and may be employed to advantage, for many more purposes than the Scotch fir. It may not be improper to mention, the best method of raising the seedling larches. Prepare a large plot in your garden with the spade, and pass a light roller over it; in April or March, spread the larch cones, either whole or cut into four pieces, on this bed; in a short time, the sun and air will make the cones drop seeds enough to fill the bed with young seedling plants. The cones are then to be swept or raked off, and a slight cover of good mould sifted over the plants. When winter approaches, they are to be covered with straw, shellings (husks) of oats, broom bushes, or fir boughs, to guard them against being

being spewed out of the ground by the frost. The second year they may be suffered to stand in the seed-bed, or transplanted *.

The third year they may be planted out in bare moorish ground ; but, if destined to be planted in grassy ground, they succeed best, after being transplanted, and suffered to grow the year of transplanting and the following year in the nursery garden. 1000 larches not transplanted, and of two years old, cost 6s.; but cost 20 and 25s. if two years transplanted. The seedlings may be planted in a cross hotch made with the spade ; but transplanted larches must be planted in pits. Autumn planting succeeds best in Forfarshire, but in a moister climate, early spring planting, after the frosts are gone, may answer better. Larch plantations should have no mixture of other trees, for when planted with other trees they outgrow them, and are liable to be wind-waved ; but when only larches are planted, they grow up equally, and form a shelter for one another. I would recommend their being planted at 4 feet distance, and left untouched for 11 or 12 years, or longer, till they are tall enough for hop poles. Were one half of them then cut and sent to the Newcastle coaleries, or to the river Thames for hop poles, it is said they would fetch money enough to reimburse the whole original expence of the plantation ; but there has yet been no experience to justify this sanguine opinion.

In regard to the climate of Forfarshire, the observations upon it are equally applicable to the rest of Scotland.

17, No country in the same high latitude, probably enjoys so mild a
climate

* The larch cones, when swept off, may be immediately laid upon a fresh bed, and will yield a second crop of seedling plants, in the same year, or they may be stored up for the ensuing season. The second crop is often too weak to resist the winter, unless extraordinary attention be employed to guard them from the frost.

climate as Scotland ; for the writer of this, has himself seen, very fine barley and oats, ripen in due season, on the summit of a hill in Forfarshire, elevated 700 feet above the level of the sea. Indeed, he is in possession of a sample of wheat, of a very good quality, which he saw growing in Badenoch, in Invernesshire, at an elevation of 900 feet above the level of the sea.

2d, From hence it may be inferred, that corn, and consequently turnip, and potatoes, may be raised thus far in height, upon the sides and summits of all the hills in Scotland ; and in so hilly a country it is obvious, that a vast accession remains still to be made to the arable land of the kingdom. On the eastern coast and hills, the tendency of the weather is to fairness, and of course fit for corn. On the western, fogs, rains, and damp weather, prevail so generally, that it would be wiser to cultivate grass.

3d, It may also be observed, that even at an elevation, too great for corn, fine crops of grass may be raised. At the Lead-hills in Lanarkshire, where those rich mines have attracted many inhabitants, the culture of corn has been for some time abandoned, and the manure laid upon the swarded grass, in consequence of which luxuriant crops of hay are annually made from their fields, which are elevated above the sea no less than 1500 feet.

4th, I would observe, that the Highlands of Scotland are intersected throughout by navigable arms of the sea reaching into their very centre: That this circumstance, affords the means of transporting by water carriage, the bulkiest articles of their produce ; and consequently, if the waste lands near these extensive coasts were planted, the trees might be disposed of to the greatest advantage.

5th, If it should be asked, what trees would grow there ? I would answer, that round the spot, where I am now writing these observations,

in

in the 58 deg. north latitude ; I view from my windows, oak, elm, beech, ash, larch, Scotch firs, poplars, willows, and quickset hedges, growing, and in as healthy a state, as I ever saw them in Hampshire.

There perhaps never fell, under the observation of an enlightened and patriotic body of men, such as the Honourable Board of Agriculture, a subject so worthy of attention, and so capable of improvement as, the kingdom of Scotland. In the opinion of the writer of these observations, the means of carrying these improvements to the greatest height, are simple, few, and certain of producing their effect. The authority of the Board should be employed, in convincing the proprietors of land, that the wealth of the tenant will ultimately enrich the proprietor, and that while the tenants are poor, the produce of the land, either to tenant or proprietor, must be inconsiderable. In order to enrich the tenant, nothing more is wanting, than to give him a permanent footing on his farm, by a long lease ; clogged with no personal services, and as few restrictive conditions as possible. By a permanent footing, I mean, that the lease should at least be for 30 years, and the life of the tenant, if he survive that period. Men possessed of capital, might then be induced to employ it in the cultivation of land. I must farther observe, that the Scotch farmers, are a sober, hard working, and hard faring people, possessing, in general, great natural sagacity. If Scotland contains a great deal of waste ground, it fortunately contains many industrious people. The desideratum is, to find the means of employing this industry to the best account, in the cultivation of our waste lands. I have mentioned leases for 30 years and the tenant's life ; but there are other measures still to be preferred. Wales, and particularly Cumberland and Westmoreland, are brought into excellent culture, by customary tenants, by small freeholders, and copyholders. The hilly parts of Devonshire and Cornwall, are occupied by tenants, on three lives, renewable on paying a fine. If these measures are found to answer elsewhere, why should they not be tried in Scotland ?



GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
ANGUS OR FORFAR.

THIS county was anciently called *Angus*, from the name of the valiant brother of King Kenneth II. who, towards the middle of the ninth century, expelled the Picts. In modern times it is also known under the name of *Forfarshire*, from the town where the courts of justice are held. It lies between $56^{\circ} 27'$; and $56^{\circ} 57'$ N. latitude; and between $0^{\circ} 6'$ W. and $0^{\circ} 40'$ E. longitude from Edinburgh. It is bounded on the west by Perthshire, on the north-west and north, by the counties of Aberdeen and Mearns; on the north-east, east, and south, by the German ocean and the frith of Tay. Its mean length from N. to S. is 32 miles; and its mean breadth from W. to E. 29 miles. It contains 928 square miles, or 467,415 Scotch, equal to 593,920 English acres. It includes 53 intire parishes, a part of two others, and supports 93,117 inhabitants. — But though this county be situated in a high latitude, yet its climate is less severe than might be expected. The sea-breezes freshen it, the Sidla and Grampian hills shelter it, and the frequent rivers and brooks, with the extensive plantations, give it a considerable degree of softness.

Sidla Hills.—The hills of Sidla, which are a continuation of the Ochill hills, extend from Perth eastward. When they arrive at the frontiers of this county, they form three divisions. One range from Lundie stretches eastward, and declines in the neighbourhood of Monifieth; a second range from Augherhouse proceeds also eastward, and makes the gentle rise on the south of Tealing, the hill of Duntroon, and the Knockhills near Arbroath: The third and highest range stretches north-eastward, and forms the hill of Lorfe, in the parish of Inverarity; and from Carbuddo, in a detached part of Guthrie-parish, may be traced in its progress, till it passes through the parishes of Kinell, Marytown, and Craig, on the eastern coast. Craig-Owl, in the parish of Tealing, the highest summit of the Sidla hills within this county, does not much exceed 1400 feet above the level of the sea.

Grampian Hills.—The Grampians traverse the island, from Cowal in Argyleshire, to Portletham in the shire of Aberdeen. In this county they run parallel with the Sidla hills, from which they are between 6 and 8 miles distant; and these lofty ranges inclose within their bosoms, the extensive and fruitful valley of Strathmore. The summit of Catla, in the parish of Kingoldrum, one of the highest Grampian Hills in this county, is found by barometrical measurement to be 2264 feet above the level of the sea.

Rivers and Brooks.—The North-Elk rises in the north-west part of the county, from a lake called Lochlee, in the parish of that name: and, after passing the ruins of the ancient Castle of Innermark, and rolling its rapid stream for 15 miles eastward through the deep and dreary valley of Glen-Elk, in Stracathro parish, joins the West-water, which had been collected among the deep indentations of the Grampians in the parishes of Lethnot and Navar, and, as it proceeds, is soon after farther augmented by the river Cruick, which had descended from the upper-part of the parish of Fern, on the south-

ern declivity of the Grampians; and at last, about two miles N. E. from Montrose, loses itself in the German Ocean.

South-Esk has its rise also, in the north-west part of the county, in the Grampians, from among the cliffs in the upper part of Clova; and, after gliding south-eastward for about 16 miles, at the ancient Castle of Innerquharity adorned with extensive plantations, mingles its waters with those of the river Profne and brook of Carity, which had rolled down through the glens or vales of the same name in the parishes of Kirrimuir, Lentrathan and Kingoldrum; and then turning east-ward, and being joined by the clear rivulet Norin, from the parish of Tannadice, and moving slowly along through a flat and fertile country, falls at last into the sea at Montrose.

The Isla issues from the north-west point of the county, from among the Grampians, 6 miles north-ward of Mount Blair; and, after rushing down through the narrow valley of Glenisla, and passing the beautifully situated castle of Airly, where it is joined by the river Melgums, from the lake of that name in the parish of Lentrathan, and dividing this county for a little from that of Perth, it at last enters Perthshire near Meigle; where it is farther encreased by the river Dean from the lake of Forfar; and at Kinclaven surrenders its waters to the Tay.

The river Dighty, has its source in the lake of Lundie, in the western part of the county; proceeds eastward through the beautiful Strath-dighty, on the north of that extensive plain in the vicinity of Dundee, on which, towards the middle of the 9th century, the Scottish King Alpin was slain in battle by the Picts; and on which about four centuries and an half afterwards, the young, brave, and illustrious Wallace encamped, as he prepared to besiege and to retake Dundee, the place of his birth, from the English; and at last, after a course of about 11 miles, pours its stream into the æstuary of the Tay, 1 furlong west from the village of Monifieth, and 5 miles east from the city of Dundee.

The river Lunan issues from a well in the neighbourhood of Forfar; and after passing through the lakes of Restennet, Rescobie, and Balgavies, and being joined by the brook Finny from the adjacent parish of Dunnichen, proceeds eastward with a limpid meandering stream, through a fertile vale which gently slopes on either side; and, after a course of about 13 miles, and a descent of about 196 feet, enters the bay of Lunan about 3 miles south from Montrose, and near the venerable ruins of Red-castle, supposed to have been built and used as a hunting residence, towards the end of the 12th century, by William I. who, on account of his successful vigour in suppressing the bands of robbers with which the country was then infested, and disdaining to pay that servile homage which the English demanded for his possessions in their country, merited and received the surname of Lyon.

Plantations. — Plantations are of two kinds; hedging and planting with trees. The hedges are generally of white-thorn, which refuses to live on no dry soil, is in spring a flowery aromatic shrub, in summer shelters the surrounding fields, is of quick growth and slow decline. Sometimes holly, sweet-briar, and trees of various kinds, are interspersed among the white-thorn hedges, which, though they add to their beauty, retard their growth. Sometimes the hedge-rows are double, and at other times single. Sometimes they are planted on the face of a ditch, and at other times an espalier of stone is employed to aid them in the means of defence. A hedge-row, with the necessary ditch, may be made at the rate of 10s. a rood, or twenty seven yards in length, 3 feet in width at top and $1\frac{1}{2}$ foot at bottom, with a proportional depth. Where stone-fences, or dykes as they are called, are employed as hedge-rows, they may be built at L 1 : 10 a rood, or 27 yards long and $4\frac{1}{2}$ feet high, with proportional thickness.

In this county, as in others, in those times when one estate feared the incursion of its neighbours, the practice of *run-rig* prevailed; as thus every tenant being equally harassed, would
equally

equally defend. But when the execution of justice became general, this practice was seen to be unnecessary. Every tenant received a spot of ground, of which no other was a sharer. He would therefore hasten to secure it from the cattle of his neighbours, by inclosing. He who possessed the richest fields had most to gain by this practice, and therefore soonest adopted it. Accordingly, in the lower part of the county, the number of inclosures is greatest.——The first mode of inclosing was simple. Large mounds of earth were constructed, and whins sown on their summits. They soon grew into disrepute, and falling into decay were never rebuilt.——It is generally believed the best method of inclosing is by white-thorn hedge-rows. The furious blast, after having passed through a hedge, is softened into a gentle gale, which fans the whole inclosed space. The stone-fence or dyke gives occasional calmness to a few yards of the space inclosed, in its immediate neighbourhood; but the rest is turbulence and conflict. Stone-fences, indeed, as soon as finished, are a complete defence, but it is not long till they fall into disrepair: Thorn hedges, after having been cleaned and pruned for some of their first years, rise in their strength, and wave their heads for ages.——The most approved size of inclosures, in this county, is between 10 and 12 acres. When inclosures are too small they are too expensive; and when too large they answer not the purpose of shelter.

Planting with trees.——There are 12086 acres planted with trees of various kinds, including the delightful clumps around the 53 seats in the county, the ashes and elms, which wave their branchy tops around the farmers mansions, and the natural birches and alders which fringe the banks of the upper part of the North and South-Esk, the Profne, and the lla.——But though a good deal has been planted, yet much remains to be done. There are 40,000 acres of hills belonging to the Sidla and the Grampians, that nature has forbidden to be subject to the plough. Would it be more then for
the

the interest of the county, that these acres should continue to be ravaged as at present with flocks and herds, or planted with trees? Fifteen hundred trees may be planted on an acre; each of these at the end of 20 years, may be sold at 2d. which would yield the proprietor an yearly rent of 12s. 6d. an acre. But could these hills be planted with trees? Some parts of them indeed are so rocky that they would utterly reject all plantation; but from the thriving state of those parts that have been already planted there is no room for despair. On the hills of Edzell, Lethnot, and Navar, the wanderer will find roots and shreds of massy old trees. These forests like those at present in Germany or Flanders, were the haunt of wolves. As they increased they preyed on the neighbouring flocks and herds, and even threatened the lives of the inhabitants. In self-defence the woods were burned, and the wolves destroyed.

Within the last five years, Colonel Fotheringham of Powrie, has planted 700 acres on the hills of Sidla. Monthrithmont, or as it is pronounced, Manroman moor, containing 5000 Scotch acres, two or three years ago, has been divided among the proprietors in the surrounding parishes of Brechin, Fernell, Kinell, Kirkden, Guthrie, Rescobie, and Aberlemno, and is planted or planting with trees.—The larch is growing fast into fashion, and will speedily supplant the Scotch fir. Its growth is more rapid, and its timber more durable. The superior durability of the larch to the Scotch fir, has been proved by laying a tree of each kind across a brook as a bridge; and the larch has endured by far the longest. The posts which support the city of Venice, are said to be of larch. If it were inserted as an article in every lease, that the tenant should plant a belt of trees around his farm, the climate of the county would be much meliorated. On several farms of the Panmure estate, which is the largest in the county, and about the seventh part of it, the tenant who possesses a plough-gate of land, is restricted to plant an acre. It has indeed been said, that trees checked by the sea-breeze arrive at no perfection on the coast. But this seems a mistake. The plantations
of

of James Guthrie, Esq. of Cragie, in the parish of Dundee, on the æstuary of the Tay, and within $1\frac{1}{2}$ mile of its mouth, are thriving and beautiful. The castle of Kelly, in the parish of Arbirlot, within half a mile of the coast, rises amid trees that are tall and excellent. In the gardens of Arbroath, on the very coast of the German ocean, delicious fruit may be found. The islands in the vast Pacific ocean are covered with trees.

——Plantation brightens a place that is naturally bleak. Whoever looks down from the surrounding eminences on the seat of Charles Wedderburn, Esq. Pearse, in the upper part of Kingoldrum parish, on that of the Hon. Walter Ogilvy at Balnaboth, in the upper part of Kirriemuir parish, or on that of the Earl of Airly in the lower part of Cortachy parish, will see paradise arise in the desert.

As the sea-breezes thus freshen the climate of the county, the Sidla and Grampian hills thus warm it, the frequent rivers and brooks, and extensive plantations, thus give it a softness. What is the nature of the soil in this county, what the mode of cultivation, and how much the produce, shall now be mentioned.

Soil.——According to writers on husbandry, there are four radical soils, and they are all to be found in this county: the light and sandy, the black loam, the clay, and the mossy soil. From Dundee, along the coast to Lunan bay, the soil is generally light and sandy, but extremely fertile. From the western part of Strathmore, as the soil proceeds eastward, it is mostly a loamy black; but when it approaches the parishes of Dun, Montrose, Fernell, Kinell, and Marytoun, grows into an open excellent clay. The small patches of ground in Glen-Esk, Clova, Glen-Progne, Glen-Carity, and Glen-Isle, which have been rescued from the dominion of the large white stones that the hand of time has thrown down from the neighbouring hills, are commonly of a mossy soil.——But besides the 40,000 acres mentioned as incapable of tillage, there
may

may be 17,500 acres that might be arable, which the ploughshare has never touched. From Alyth or the western border of the county, the traveller as he proceeds to the church of Gleniffa, will perceive a tract perhaps 10 miles long and 1 broad, in which a furrow has never been drawn. Large shreds also of waste ground that might be arable, stretch themselves at the feet of the Sidla, and along the south base of the Grampians. To him who would be at pains to survey the whole county, spots covered with furze, broom, or heath, would be seen even amid fields that industry and skill have fertilized. These spots, however, like some barbarous state amid civilized nations, are gradually being conquered. Every farmer to whose share any of them may have fallen, improves part of them yearly. The mode of bringing waste lands under culture, adopted by Patrick Cruickshank, of Stracathro, Esq. a gentleman of the most active diligence and skill, is this : The field to be cultivated he first makes dry, either with open drains 6 feet wide at top, 1 foot at bottom, and three feet deep, which may cost, a rood, or 6 ells long, between 10d. and 1s; or by covered drains, 18 inches wide at top, between 2 and 3 feet deep; and having one of these feet filled up with loose stones, which may cost 3d. a rood. After the field is thus drained, he ploughs it five times before sowing. The first and second furrow is about 14 or 15 inches deep, and is drawn by 6 or 8 strong horses or oxen. The other two furrows are not so deep, and are generally drawn by two horses or oxen. When the field is to be sown, between 50 and 70 bolls of his own lime-shells are laid in small heaps on each acre. A cask is then filled with water, and a quantity poured on every heap. As soon as all the heaps are slackened, which requires no long process, they are spread, and the land is harrowed. The lime is thus finely incorporated with the soil; and 12 bolls of barley or wheat may be expected. — Perhaps the best method of bringing waste lands under culture is by letting them in perpetual feus. Vigour nerves the arm of a man, who looks round on the spot of which he and his posterity are likely to be lords. The good effects of feuing are very conspi-

cuous

cuous at the village of Letham in Dunnichen parish, which in A. D. 1788, was erected by George Dempster, Esq, the proprietor. In Letham, streets have been marked out on a regular plan; the houses are all built of stone and lime, are generally two stories high, and are all slated. The villagers have increased to upwards of 200, pay the proprietor yearly L. 2 an acre for what they possess; and a fair every fortnight has been established among them, at which, for their flax, yarn, and cloth, they often receive L. 500—Were one village of this kind built near the hills of Sidla, on the road from Glammis to Dundee, and another on the road from Alyth to the church of Glenisla, speedy and lasting good would arise. But though a part of the county, not inconsiderable, which might be made arable, be thus untouched by the plough, yet it ought not to be omitted, that what has been brought under tillage, is generally in a high state of cultivation.

Cultivation.—It is not easy to describe the rotation of crops in the county. One farmer often differs in practice from his next neighbour, as superior information or experience directs him; except on a few estates, and in two parishes, Carraldstone and Fern, where the tenants are restricted to a particular rotation. In general, however, it may be said, that from Dundee, to the bay of Lunan, and throughout the low and western part of Strathmore, the one half of each farm is under grass, and the other under tillage. Thus, for instance, in a farm containing 200 acres, 100 are in grass, 40 in oats, 40 in barley, and 20 in fallow, potatoes, turnips and pease. In the clay soil of the eastern part of the county, the most approved rotation is: 1st, fallow, 2d, wheat, 3d, pease or beans, 4th, barley sown with grass, 5th, green-feeding or hay, 6th, oats. In the upper part of the county, Lochlee, Lethnot, and Navar, Clova, Glen-Profne and Glenisla, little fallow is used; turnips and potatoes being thought sufficient for cleaning the ground. In the lower part of the county, oats are never seen to succeed oats or wheat, nor barley to succeed barley.—

B

What

What then are the kinds of grain usually cultivated? They are wheat, oats, pease and beans, flax and barley. Clover, turnips, and potatoes, are also in general use.

Wheat.—Wheat is sown in every parish of the lower part of this county; but in greater quantities by far on the clay-soil, because it is not so easily impoverished as the others. It is chiefly of the white kind. It is generally preceded by fallow, turnips, or potatoes. It is usually sown in September, and reaped in the following August or September; produces from 10 to 16 bolls an acre, weighing between 14 and 15 stones Amsterdam a-boll, which seldom brings in less to the farmer than 20s. There are probably about 4500 bolls exported yearly from the county. To save wheat or other grain from degeneracy, the seed corn is brought from an opposite soil. Seed-corn from lands that have been marled, if the soils be opposite, prospers remarkably on lands that are limed.

Oats.—The Angus oats are celebrated. A quantity of them is sent yearly to England for seed-corn. The Essex kind is not altogether unknown. They might appear peculiarly adapted to a northern climate, as they need the space of one month less in the ground, than the common oats; but they thrive only on soils of extreme fertility. There is another species of oats, called black oats, which are to be found in some high parts of the county, particularly in Glenisla, and are used as grass-feeds. When the soil, tortured for a series of years, with alternate crops of oats and bear, refuses to give any produce, it is indignant sent to rest with black oats; and as soon as it gathers a scurf, is seized and tortured anew. But as improvement is advancing with so rapid a pace in other parts of the county, it is hoped this practice will speedily be abolished, and be mentioned only as the tale of other times. Oats are sown in the part of the county lying along the coast, and in the centre of Strathmore, sometimes in February, but often in March, according to the earliness or lateness of the season;

fow; and are reaped in the following August or September. The immediate neighbourhood of the hills, retards the time of sowing and reaping for the space of a fortnight or three weeks. In Glen-Esk, and it is much the same in Lethnot, Navar, and Glenisla, the storms are late in retiring. Seldom is the plough drawn forth till the first week of April to prepare for the ensuing crop, which, if not broken down by the violent gusts descending between the hills, is in great hazard of being overtaken by the speedy return of winter.—The Effex oats have produced 18 bolls an acre, and the common oats 12 or 13; but the average quantity produced on an acre is nearly $\frac{2}{3}$ less. A boll of oats weighs about $14\frac{1}{2}$ stones Amsterdam, and seldom falls at less than 12 or 13s. The fashion of making bear and barley bread-corn, is gradually departing the county; and great must be the consumption of oat-meal, where it is part of the daily food of five manufacturing towns, and two large manufacturing villages.

Beans and Pease.—There are not many beans sown in the county. Pease are sown on some farms earlier than oats, that the produce of grain be not lessened by luxuriance of straw; but in general they are sown later than the oats, and earlier than the barley. They are reaped at the same time with the oats and the barley; and often bring 15s. a boll. The tendrils of pease kindly creep along the ground, and infuse a richness which benefits the following crop.

Flax.—Flax is uniformly sown later than oats, and earlier than barley. It is reaped in July or August. There is not much flax sown from Dundee to Arbroath; but along the middle of Strathmore it is found in large quantities. On one farm in Carraldstone parish, on the banks of the South-Esk, are annually sown between 40 and 50 acres of flax. Between 9 and 10 pecks of Dutch lintseed is allotted to an acre, which may yield at an average 30, or even sometimes 50 stones averdupois. The practice of skutching flax with the

stock and hand, is now almost totally extinguished. Lint-mills have been erected on the rivulets and branches from the principal rivers, that clean the flax with more expedition and cheapness than the ancient method. The price of preparing a stone for the heckle, is from 1s. 4d. to 1s. 6d. and the price of a stone so prepared is from 12s. to 12s. 6d. —Perhaps it might be for the interest of a manufacturing county like this, that flax were so generally cultivated, as entirely to supplant the use of what is brought from abroad. How many pounds are thus annually given to the inhabitants of Holland, and Russia, which were better retained at home? Why might not this county produce flax as well as these countries? The culture of oats and of wheat are not yet abandoned, because they are grains that have a tendency to weaken the soil. Flax, as in the present practice, might succeed grass; and what was in flax might be dunged for barley. The raiser of flax indeed cannot bring it soon to market; but when it is brought, he will be amply repaid. Our own lintseed might probably succeed as well as the Dutch, if we were at as much pains to save it from degenerating, as we are to save our different grains, or were it kept unthreshed till the spring.

Barley. —The common barley is used generally in the lower-part of the county; bear which is a hardier grain is used chiefly in the hill-district. In the lower-part, English barley is also sown. Its stalks are not so long or slender as those of common barley, nor so apt to suffer from stress of weather; but in Strathmore, they complain, that on grounds which are marled it arrives too late at maturity. Barley, after having commonly received 3 furrows, one in autumn, another in spring and a third at seed-time, is committed to the soil towards the end of April or in May. Barley has been sown here by way of experiment in autumn; but gave no encouragement to future adventurers. It is often preceded by fallow, and one boll is generally thought sufficient seed for an acre. It is reaped towards the end of August, or in September,

tember, and between 8 and 12 bolls is the average produce on an acre of good land; and each boll of which often is sold at 18s. Upwards of 50,000 bolls of bear and barley are annually exported from this county. The bear weighs 17 stones, and barley 18 or even 19 stones Amsterdam; and both of them find a ready market in the Frith of Forth, in Holland, Norway, and other foreign countries.

Clover.—There is not a person possessed of a spot of arable ground within the county, on some part of which he sows not a little clover. Before the recent use of clover, it is not easy to conceive how it was practicable for horses and oxen to undergo the fatigue of cultivation. In summer, the cattle were sent to starve on heath, and the horses had no other pasture, but the thin piles of grafs which grew by the way-side, or on the *balks* or stripes of waste ground that divided the small possessions of neighbouring farmers; and to neither horses nor cows was other supper ever given than thistles. When winter returned, the oxen were recalled from their heath, the horses were deprived of their thistles; there was no hay, and but little corn to give them. He was thought a good farmer who could boast, that in the spring, the season of labour, neither his horses nor his oxen had fainted with the necessary fatigue. When clover appeared, the signal of plenty was given, and the cattle became strong for labour. Clover is sometimes sown among wheat or oats, but prospers best with barley. An acre of ground intended to produce hay or green-feeding, is in the lower-part of the county sown in this manner: 20 lbs. red clover, Dutch or English, and 2 bushels of rye-grafs. An acre of ground, intended for hay or green-feeding, in the upper district is thus sown: 10 lbs. red clover, 5 lbs. white clover, and 6 pecks of rye-grafs. An acre in the lower-part for grafs to be pastured is thus sown: 10 lbs. white clover, 6 lbs. red clover, 2 lbs. rib-grafs, 2 lbs. yellow clover, with 2 bushels of rye-grafs. Between 150 and 300 stones of hay Amsterdam, may be raised on one acre; and the stone sells generally

generally between 6d. and 10d. An acre of good grafs for green-feeding, in the immediate neighbourhood of Dundee, will let at between L. 7 and 12, and in other places between L. 5 and 7. An acre of good sown grafs for pasture may let at between L. 2 and 5.

Turnips.—Turnips both white and red are used, and sown about the middle of June, sometimes in broad cast, but commonly in drills. Turnips of 28 or 30 lbs. Averdupois may sometimes be found; but whether any of them ever swelled to the large size of 40 lbs. as among the Romans in the soil of Italy, is uncertain. Besides purifying the soil from weeds, and preparing it for the crop, they cause the milk of cows to stream amid the storms of winter. An acre of good turnips, in the neighbourhood of one of the large manufacturing towns, may sell between L. 5 and L. 10. When turnips fail in the spring, cabbages planted in the fields in drills, supply their place.

Potatoes.—Of potatoes various kinds are used, and the most mealy are reckoned the best. They are generally cut in small pieces having at least one eye; and are planted in the field in May, in drills like the turnips. Between 50 and 60 bolls, each boll weighing 16 stones, Amsterdam, are not unfrequently the produce of one acre. As they thrive on any dry soil, as they require not more than 5 months space in the ground, as by planting them early in spring, they may come to maturity in June or July, they cheaply supply the poor with bread, before the return of the crop, and give additional relish to the feast of the rich. They generally sell from 5s. to 6s. a boll.

Yams.—Yams, or the Surinam potatoes, are also planted in drills, but are only used to feed horses and cows. They give no disagreeable taste to the milk, like turnips.

Horses.

Horses.—In this county there are 8921 horses ; a pair of which in the lower-part may cost L. 52 : 10 ; but in the upper-part not more than L. 16 or L. 20.

Cattle.—There are 36,499 cattle. In the hilly parts, they weigh from 16 to 20 stones Averdupois ; but in others from 40 to 70. Some of the small breed are often fattened in grafs-inclosures to 40 stones. A farmer in the parish of Glamis, fed an ox in grafs-inclosures during the summer, and with turnips and hay during the winter, and when seven years old, he weighed 100 stones averdupois, and was sold to the butcher at forty guineas. A great number of cattle are seldom reared by those who possess many grafs-inclosures. They buy cattle from the northern counties, from the 1st of May till 1st of June ; and after fattening them in inclosures during the summer, sell them in autumn, either to the butchers in the neighbourhood, or to the dealers from England. A considerable quantity is also purchased when lean, from the northern counties in autumn ; which being either in winter fattened with turnips, or fed in the straw-yard, is sold in spring or following autumn. The admission of larger males has increased the size of horses, and might increase the size of cattle ; but, perhaps cattle of great weight could not find support in hilly pasture, where their best fare would be occasional spots to which rills in their descent had given a greenness, or some slender piles of grafs mingled with the heath. A considerable number of calves reared in the lower-part of the county, are fed with as much milk as they can drink for 6 weeks in boxes, to prevent that frikking which is favourable to growth, but not to fatness ; have a bit of chalk to lick at, which whitens the veal, and are occasionally bled to promote the circulation. One lib. of this veal sells at 6d ; beef seldom at more than 4d.

Sheep.—There are 53,970 sheep in the county. At the dawn of agricultural improvement, farmers thought themselves

themselves justified, in banishing the sheep from grounds the plough had touched; but they now begin to be admitted to grass-inclosures. Several proprietors, and some farmers, keep considerable numbers of the large Bakewell, and Northumberland breeds. Their wool is preferable to that of Highland sheep, and they do not so readily overleap the fences. The sheep of this county are chiefly in the hill-district, and are of three kinds; the black-faced from Linton or Biggar, the white-faced or ancient Scotch, and the mixed breed. The black-faced may weigh 12 lbs. a leg, and sells at 12s. The white-faced may weigh 6 or 7 lbs. a leg, and sells at 8s. The mixed breed may weigh 8 lbs. a leg, and sells at 10s. A pound of wool, 24 ounces averdupois, brings from 10d. to 1s: 3d; and the price of 1 lib. mutton is 4d.

Salt-works.—David Scott of Dunninald Esq. Member of Parliament for the county, in the spirit of true patriotism, is erecting salt-works on the sea-coast near to Ufan or Ulysses's haven, the beautiful seat of his brother Archibald Scott, Esq. a gentleman of great liberality of sentiment; and which salt-works will manufacture yearly 3000 bolls of salt, supply a third part of the county on reasonable terms with that important and necessary article, and tend to break the improper monopoly of it in the south of Scotland.

Such then being the soil, cultivation, and produce of the county, it now falls to be mentioned, what are the implements employed in its cultivation; to give an account of the persons who use those implements; of the farmers who occupy the lands, and the proprietors who let them.

Carts.—A man now as formerly, derives no eminence from being the possessor of a two horse cart. In the lower-part of the county, a cart with harness for a pair of horses may cost from L. 9 to L. 13: 13; currachs indeed, for the carriage of corn, and creels for the carriage of peats, which may cost 1s. a pair, are still in use, in the remote and northern parts of the county. Ploughs on the construction of Mr. James Small of Berwickshire

wickshire are often tried, and succeed on lands that are level and free from incumbrance. Except in Glenisla or Glen-Esk, an old Scotch plough is in fact a rarity. The old Scotch plough improved, however, with the metal boards, is in general use, and costs from L. 1 : 15. to L. 2 : 2. Four horses are often yoked at once in a plough; but generally there is not more than two. To draw one plough in the upper-part of Glenisla, six small horses in a row are frequently employed, which the driver, as he goes backwards with cautious steps, and watchful eye, keeps to their labour. Many specious arguments has the ingenious Lord Kaimes, in his Gentleman Farmer, adduced, to prove the superior cheapness and excellence, of oxen to horses, in husbandry; but few are the converts he has made to the doctrine in this county. Oxen, when old and unfit for labour, may be fattened and sold for beef at a high price: horses when old are useless. Oxen, when shod and harnessed as horses, will perform all the operations of husbandry which they can perform, and are more easily supported, for they are content with straw and hay, and need no corn; but after all, they are so slow in their movements, that he who has had experience of horses, would reluctantly lay them aside for oxen.

Wages of labouring servants.—The wages of servants employed in husbandry, are high. A labourer, for 8 months in the year, is allowed 1s 3d, per day, without board; with board, 10d; if employed in digging fuel or mowing hay, he is allowed 1s. with board; a boy, about the age of fourteen, between L. 3 and L. 4 a year; a man, a year, between L. 7, L. 10, and L. 12.—Most of the farmers yet dress the victuals of their labouring servants along with their own; but this custom is growing into disuse. The practice now begins to prevail, of allowing them for victuals, 2 pecks of oat-meal a week, or 6½ bolls a year. A Scotch pint of new-milk, is allotted to each a day, and the necessary quantity of salt, or a shilling in its stead. When they return from their labour, in the

C

house

house of the farmer, boiling water is ready for their use. They put as much meal into a wooden dish as they think they can eat, and having, with the water, made it into a proper consistence, they diet in this manner thrice a day. Such servants as are more luxurious than the rest, sell part of their meal, and purchase what provisions are more suited to their taste. This mode of diet, gives less trouble to the farmer than the ancient one, is equally cheap, and is more approved by the generality of servants.

Shearing.—Shearing or reaping of corn, is sometimes undertaken by the piece. An acre is cut down for 7s. or 8s. Most farmers, however, employ regular shearers. A male shearer receives between 24s and 32s; a female shearer between 16s and 24s. Some farmers give, for breakfast to their shearers, oat-meal pottage, with milk to satisfaction; for dinner, a loaf, 12 of which are baked from 1 peck, with 3 mutchkins of small beer; and for supper, pottage and milk, as at breakfast. Others breakfast their shearers with the oaten loaf, and a chopin of small beer; while they give them the dinner and supper just now mentioned. To such shearers as have houses, $\frac{1}{2}$ lippie of oat-meal, every day, is allowed for supper at the close of harvest. Then every shearer expects a shilling above his wages, or to share in a supper of broth and beef; at which the sound of the violin and the dance are often heard; the price of shearing is generally paid, and an agreement for another harvest not unfrequently made.

Employment at different seasons of the year.—The labouring servants, in the lower and most cultivated part of Angus, are employed in this manner at the different seasons. In Seed-time, they rise at 5 in the morning, dress their horses, cleanse their stables; at half past 6 give corn to their horses, go immediately to breakfast, and begin their labour at 7. They return at 11, and, when necessary, carry the utensils of husbandry to the smith's shop, or unthreshed corn to the barn,

or

or winnow grain; at 1, feed their horses, dine at 2, re-enter the field. They desist at 6; feed and litter their horses; and after supper retire to rest. In Summer, they rise at 4, feed their horses with grafs, begin the labours of the field at 5, and prolong it till 9. An hour is allowed for breakfast; after which, part hand-hoe turnips and potatoes, or in the season, assist in making hay; while the horses in the field or in the stable are regaling on grafs. Between 1 and 2 another hour is allowed for dinner; and from 2 till 6, the labour continues; after which, grafs for the horses supper and breakfast, is provided.

In the early part of Harvest, shearers begin their operations at 5, or as soon as they have light; about 7, breakfast is brought to the field, and an hour for breakfast is given. At the end of every ridge, 900 or 1000 feet in length, a cessation of labour for 10 minutes is granted. Dinner is set down at 1; and from 2 till 7, or till light depart, they toil. While the crop is under the sickle, the farmer may call away any of the hired shearers, to assist his own servants in carrying in what corn he thinks ready for the barn-yard; but when the shearing is finished, the hired shearers, according to agreement, go away, and leave his own labouring servants to gather in the remainder of the crop. The ancient, broad, crooked, and high crowned ridges, that yet prevail in the hill-district, are almost all in the lower part disused. The ridges now are generally straight, mostly level, save in very wet places; and may be about 16 or 18 feet wide. Some place 2 male and 1 female shearers on one of these ridges, and others 1 male and 2 females. In the former case, 1 male and 1 female lay corn in the same rope; and 2 shearers swell beside each other during the length of the ridge. In the latter case, the man makes the rope, and the two women fill it with corn. In the former case, one person is employed to bind the sheaves, and set up the shocks of one ridge. In the latter case, for instance, 3 persons are employed to bind the sheaves and set up the shocks of 15 shearers.

In

In Winter, labouring servants rise at the dawn of day, diet and dress their horses, cleanse their stables, breakfast, and at half past 8, begin their labour, and continue it for 5 hours, till half past 2. They then turn dung hills, or open and clear water-courses, or take and bundle straw, riddle grain or winnow it, and prepare supper for their horses. In the hill-part of the county, labouring servants rise in spring between 4 and 5, feed their horses, begin their labour between 6 and 7, and desist at 12. At 2, labour is recommenced and ended at 6. In Summer, they rise between 2 and 3, proceed to their toil, and after about the space of $4\frac{1}{2}$ hours employment, consign themselves for 2 hours to sleep. Between 12 and 1 labour again begins, and ceases not till sun-set. The shearers in Harvest lay their hands on their sickles as soon as the weather permits, receive their ordinary food, and remain with the farmer till every shock of the crop is fully gathered in. In some places, as the farms are very small, and the number of servants necessary to provide fuel is great, the farmer seldom needs any to hire for harvest. In Winter they are employed in threshing out the grain, and in tending the sheep and the cattle. On a few of the large farms, in the most cultivated quarter of the county, machines are employed which thresh between 4 and 6 bolls an hour, and cost about L. 60; but the generality of farmers employ for this purpose, men, called *Lotmen*, who receive the 25th boll of grain they thresh out, with breakfast, and a small allowance for dinner; or the 21st boll; without victuals.

Kilns. — In two or three parishes of this county, there are corn-kilns, on an improved construction. Like other corn-kilns, they are erected on the side of a steep, and, at an opening in the upper-part of them, the grain to be dried is introduced. In other corn-kilns, there is but one window or opening in the upper-part, but here there are three; two opposite each other, and one opposite to the door where the fire is lighted. The two windows or openings in different parts
of

of the kiln, serve as a ventilator for carrying off the smoke from blackening the grain; and this process of ventilation can never be obstructed, by means of opening or shutting one of these windows as may be seen necessary. In other corn-kilns, if the wind chance not to blow evenly in the door, the fuel refuses to burn; and though the wind be in the wished for direction, as it sometimes will blow high, and at others low, the grain to be dried will be now scorched and anon raw. In this kiln, a pair of large bellows, like a black-smith's, is suspended at the door, whose long pipe is bent up among the fuel, and the person who is to dry the grain, by blowing occasionally; renders the degree of heat always equal. Kilns are generally built of stone and lime, are secured from fire by iron beddings, and supporters of the same metal, and are now seldom seen but in the vicinity of a corn-miln.—

Thirlage.—Thirlage,—by which the proprietor of an estate restricts his tenants to a particular miln, and by which their grain is neither so well cared for, nor their meal so well made, is not yet entirely abolished; but, like the want of Leases, *arriages*, or the ploughing and sowing the landlord's farm, *Bonnages*, or the shearing his crop, *carriages* of different kinds, all remains of the feudal servitude,—are growing fast into disuse.

Rent.—As the cultivation of this county has advanced so much, it may reasonably be expected that the rents paid by the tenants to the proprietors, have made a proportional progress. In the year 1656, during the usurpation of Cromwell, when the lands of the different counties in Scotland were valued for the purpose of taxation, the rent of this county was precisely L. 171,642: 14: 7 Scotch, or L. 14,303: 11: 2½ sterling. The present rent of the lands of the county, is about L. 96,112, which is considerably more than an increase of 6 times, in the space of 138 years. The rent of the 5 Burghs is about L. 17,510; the emolument for marle is about

L.

L. 2466; for lime about L. 4000, and for fisheries, about L. 1100; which together will amount to L. 121,288. The yearly rents of the farms in the lower-part of the county, are from L. 100 to L. 300; but in the upper-part from L. 10 to L. 100.

Leases.—Leases are given for periods of different duration; for 15, 21, 35, 36, 38 years, and sometimes a life: but the lease most commonly given, is for 19 years. Surely that duration of lease is best, which gives the tenant most encouragement to improve his land, and time to receive a proper return. Perhaps it were for the interest of proprietors, to annex to each lease the lifetime of the tenant. Men are attached to the place where they have long been, and remove with sorrow. A tenant, therefore, whose lease gives him the hope of passing his days on his farm, may be expected to display greater exertions of industry, than one, who, at the expiration of a few years, dreads that his well cultivated fields may become the possession of another. But how long soever the lease may be, if the rent be too high, the tenant will be forced to depart.

In general, the best land of the county, except burgh-land, may let at between 27s. and 40s. an acre; and the second kind between 15s. and 27s. —A proprietor ought to study agriculture, as a person studies any science, by which he is likely to gain his livelihood. —Suppose a farm, at the utmost pitch, in some excellent seasons, to be worth L. 100 a year, it ought to be let perhaps L. 30 under. The tenant ought to be recompensed for his personal trouble; he may have loss by merchants; his cattle may die, or sickness and disease assail his family. It tears the heart of a humane landlord, to throw forth an innocent and helpless family, on the mercy of an un pitying world.

Farm-houses and Offices.—There is scarcely a parish in the county, where the farm-houses are not fast improving; where the principal ones are not two stories high, and covered with slate. Charles Lyel of Kinordy, Esq. in Kirriemuir parish, has

has built some excellent houses and offices for his tenants, and requires, of additional rent, from 6 to $7\frac{1}{2}$ per cent. The antient mode of building farm-offices, wherever the impulse of the moment directed, is abandoned. The offices lately built, have been formed into a square, containing barns, byres, and sheds for cattle; but there are instances in which the mansion-house completes the court, which is unfavourable to elegance and to health. L. 300 is thought a competent sum for completing a mansion-house and offices for a farm between L. 100 and L. 300 of rent.

Value of Estates.—One estate in the county rents nearly at L. 12,000 a year. He who enjoys an estate between L. 500 and L. 1500 a year, is reckoned among the principal heritors. As farms improve, estates rise in value; and when sent to the market fetch an high price. It is not mentioned as extraordinary, that an estate of 150 acres in St Vigean's parish, which, in 1765 cost L. 2300, a few years ago was sold at L. 5800.

Causes of Improvement.—Having taken this general view of the state of agriculture in this county, it may be proper to mention the principal causes which conspired to its improvement.

Before the year 1745, small was the skill of agriculture in this county. Every proprietor retained in his own possession a farm, which his tenants cultivated. They paid their rents seldom in money, but almost always in kind; a certain number of bolls of bear, oats, cattle, sheep, and kane fowls.—They lived in huts on the homeliest fare; were content with the coarsest attire, and with the rude utensils of husbandry of their own formation. About this period, manufactures dawned on the county, and a new market was opened for provisions. Multitudes left the country, the abode of poverty, and fled to the town, the fountain of riches. They returned to the country with offers for farms, so tempting to the landlords

lords, that they could not resist them. Exertions of industry were displayed, and one tenant followed the example of another. The proprietors seconded their efforts, gave themselves up to the study of agriculture, and procured information from England.

Lime.—Soon after, lime, which had been previously discovered, and used as a cement in the parish of Craig, on the eastern coast, began to be used as a manure by Mr Scot of Dunninald, father to the present Mr Scot, member of parliament for the county. One related to another, the wonderful effects of lime, and none held grounds in the neighbourhood on which it was not laid. As the carriage overland, to the southern coast of the county, was very expensive, lime was brought thither by sea from the frith of Forth, and from North and South Sunderland in England. Of the two principal lime quarries in the county, the one is at Budden in the parish of Craig; the other at Stracathro, in the parish of that name. The lime of both quarries is praised, and none of them will soon be exhausted. The Budden lime is sold at 22d. a boll, paid on receipt, and 23d. on credit. The Stracathro lime is sold at 23d. a boll, paid on receipt, and 2s. on credit. The boll in use, at both quarries, is the Linlithgow one. For a first liming on black loam, from 20 to 40 bolls of shells may be laid on an acre, and on clay soil, from 50 to 70.

Marle.—While lime was producing remarkable effects on the coast, the western part of the county wanted a powerful manure. It was not long denied. Between the years 1730 and 1736, Mr Pearson, sheriff-depute for the county, who was proprietor of the estate of Balmadoes in Rescobie parish, discovered marle in the adjoining lake of Balgavies. The estate was afterwards purchased by Captain Strachan, who, improving on the discovery of Mr Pearson, dragged up marle from the lake of Balgavies, in much the same manner as ballast is dragged up from the bed of the river Thames; but after

ter manuring his own fields, he had little to spare for those of his neighbours. About A. D. 1760, the late Earl of Strathmore lowered the water in the lake of Forfar, and opened a fresh supply of marle. In the lake of Rescobie, in the parish of the same name, in Backie in Airly parish, and in Kinordy in Kirriemuir parish, marle was discovered. In A. D. 1790, George Dempster, Esq. of Dunnichen, drained the lake of Restennet, which covered 128 Scotch acres, and brought to light an almost inexhaustible treasure of shell-marle, of a quality superior to what the county had ever beheld. It lies below a bed of some feet of moss, from 2 to 13 feet in depth. It is almost pure calcareous matter, little discoloured by clay, or debased by sand. It is sold at 8d a boll, containing 8 solid feet; and last season brought the proprietor no less a sum than L. 1336 : 13 : 4. About 60 bolls are allotted to one acre for the first marling; and its effects are so remarkable, that when a proprietor, within 6 or 7 miles, is to let a farm, it is not unfrequent to inform the public, how far it lies from the lake of Restennet. Beside the benefit which accrues to the county from so precious a manure, it is no mean advantage that the moss which covers it, affords them fuel. —Great however as has been the advantage of lime and marle to the county, yet like other privileges they have been abused. On the first discovery of lime and marle, many were of opinion that they partook of the nature of dung, and that the larger the quantity strewed on a field, the more it would produce. Accordingly, those who possessed farms in the vicinity of these manures, laid down as many bolls on an acre as they could buy or convey, to the number of an hundred or three hundred. Several fields were thus deadened, and it was long before they revived.

Compost dunghills. —After the use of lime and marle, as manures, was introduced, various other improvements were made in agriculture. The practice of mingling a quantity of earth with lime or marle in dunghills, among several others, became universal.

Sea-weed.—In some parishes on the coast, sea-weed is used as a manure. Fifty bolls are spread on an acre, which without the assistance of lime, for 3 years, produces an excellent crop, particularly of barley.

Watering of grounds.—Even the streams that trickled from the hills, and were thought to mar the adjacent fields were rendered useful. Mr. Scrimgeour of Tealing*, in the parish of that name, and Mr. Kinloch of Kilrie, in Kirriemuir parish, have availed themselves of their situation for watering their grounds.

Roads.—Before A.D. 1745, the roads in this county were narrow, winding, rugged, and steep. Except in the most cultivated parts, wheel-carriages were little used. Their corn, and their fuel, were conveyed home on frames of sticks, called *currachs*; or in a kind of panniers, called *creels*, thrown over the horses backs. When, in the progress of improvement, farmers had grain to dispose of, the need of roads became perceptible. To accomplish this valuable purpose, the statute labour, which called forth a farmer's servants and horses for a certain number of days in the year, was applied. But of the work which men are forced to do, and for which they have not the prospect of immediate recompence, they seldom do much or well. With a generosity therefore, and public-spirit which do them honour, the proprietors of land in the county, in A. D. 1790 applied for and obtained an act of Parliament, for leave to make by subscription among themselves, roads 36 feet wide, and that might not have an elevation of more than a single foot, in twenty. Tolls are levied every six miles; 2d. for a saddle horse and 6d. for a two-horse cart. For making and repairing proper roads across the county to lead into the toll ones, the statute labour has been converted into a tax of 24s on the L. 100 Scotch of valued

* For a particular account of Mr Scrimgeour's improvements by watering, See the Statistical Account of Scotland, vol. iv. p. 94.

ed rent ; which is proportioned by the proprietors among their tenants. New roads, to and from the 5 principal towns and the 2 principal villages, have already been made, and are in high repair. If the same vigorous exertion be displayed for a little time by the proprietors, there will soon be no corner of the county, so obscure or remote, to which the traveller will find an excellent road.

Such then, is the agricultural survey we have taken of this district. In many things it may be deficient, and in some erroneous. Every deficiency, however, will be amply supplied, and every error properly corrected, by an application, on the part of the Board, to some of the many intelligent proprietors and farmers, of which this county can boast *.

* Among many others, the following Proprietors and Farmers, would with pleasure give any additional information to the Board of Agriculture.

PROPRIETORS.

Hercules Ross, Esq. Rossie, by Montrose.

Patrick Cruickshank, Esq. Stracathro, by Brechin.

Colin Gillies, Esq. Brechin.

George Dempster, Esq. Dunnichen, by Forfar.

James Guthrie, Esq. Craigie, by Dundee.

FARMERS.

Mr. Andrew Cairns, Englistone, by Cupar-Angus.

Mr. David Arklay, Ethiebeaton, by Dundee.

Mr. Leighton, at Dunninald, factor to David Scott, Esq. of Dunninald,
M. P. by Montrose.

Charles Greenhill, of Bolchan.

ABSTRACT of the Agricultural State of FORFARSHIRE.

Contents.	{	In Square miles,	-	928
		In Scotch acres,	-	467,415
		In English acres,	-	593,920
Number of parishes, exclusive of a part of 2 others,				53
Number of inhabitants in 1794,				93,117
Population in 1755,				68,883
Increase,				24,224
Gentlemen's seats,				53
Acres planted,				12,086
—— not arable,				40,000
—— arable, though not yet plowed,				17,500
Wheat exported, about				Bolls, 4500
Bear and barley exported,				Bolls, 50,000
Rent, in 1656,				L. 14,303 11 2½
Present rent,				L. 96,112 0 0
Number of horses,				8921
—— cattle,				36,499
—— sheep,				53,975



APPENDIX.

ON WATERING LAND.

Extracted from the STATISTICAL ACCOUNT of SCOTLAND, Vol. iv. p. 94.

(Parish of Tealing.)

WATER has been long used as a manure in several parts of this county, and in other quarters of the kingdom; but as the subject of watering, in general, is either altogether omitted, or but slightly mentioned by several of our best writers on husbandry, the subsequent account of the mode of watering land, adopted by Mr Scrymgeour of Tealing, may be of some utility.

Mr Scrymgeour waters no lands but such as are of a dry black or loamy soil. Sand can receive but little benefit from water, as it cannot retain it for any time. Clay is rather chilled, and (especially if the following season prove remarkably dry) too much hardened by it. He does not water any field till it has been at least two years in grass. Perhaps the year before it is broken up, is the most proper for the operation. He finds the spring and autumn to be the fittest seasons for it. If it be done in the spring, it should be before the grass has made any considerable advances, otherwise that crop will be apt to suffer by it. If in autumn, it will be proper to draw off the water before the strong frosts set in. Previous to the operation, it is necessary to spread the mole-hills with great care; as also with the foot, to press down the run of moles, so far as can be discerned, as it is very apt to draw off the water in an improper direction. The process commences with the drawing of water-furrows. First, one broad and deep furrow is drawn in the crown, and from end to end of the head ridge, on the highest side of the field. This is to serve for a channel for the whole water you intend to make use of; and must be enlarged to a sufficient capacity with the spade, if it cannot be done with the plough. If the ridges be level, another furrow is drawn parallel to the first, of equal length to it, and about 8 or 10 yards distant from it; and furrows in this manner are drawn down through the whole field. The more the
ground

ground slopes, the more numerous these furrows must be; and care must always be taken, that the sward turned up by the plough, be thrown upon the lower side.

The water is then brought in at the highest corner of the field, and allowed to run in the channel or great furrow, for the breadth of 4, 5, or perhaps 6 ridges, according to the quantity of the stream. It is then dammed up, when upon a small opening being made in the lower side of the furrow, opposite to the crown of each ridge, it pours itself in an equal manner into the field below. It is soon intercepted by the next furrow, which serves not only as a channel for it, but as a dam-dike to make it spread itself over a considerable part of the ground immediately above: When it begins to overflow, let small apertures be made in the furrow opposite to those mentioned before, and for the same purpose. In this manner it is sent from furrow to furrow, till it reaches the lowest side of the field. When the first 5 or 6 ridges are done sufficiently, (that is, when they are saturated with the water, which may be known by the soft swelling of the ground, and the bright verdure of the grass), open the main furrow against other 5 or 6, and thus go along the whole.

When the ridges are much raised in the crown, as is still the case in many parts of the country, the furrows must be made in a different manner. One communicating with the first or great furrow must be drawn down the crown of every ridge, unless it was cloven when laid down in grass. From this again, at every 6 or 8 yards distance, others must be made, pointing obliquely down the sides of the ridge, till they meet and form an angle with others drawn in the same manner on the next ridge, taking care, as in the case above mentioned, that the plough throw the earth toward the lower side. The water is then let down into the crown furrows, and stopped at proper distances, so as to make it spread over both sides of the ridge.

It would be vain to attempt to give directions for every particular situation or surface of ground. The great general rule is to draw your furrows in such a manner as to distribute the water equally and plentifully over every part. By attending to this, and taking a careful survey of the field, an intelligent ploughman will very soon see what he has to do. This also is to be attended to, after the water is brought upon the ground, and it will require a daily visit from a careful hand with a spade, to remove obstructions that may have dropt into the furrows; to place others properly; and to lead the water to such heights and dry spots as may have been overlooked. Mr S. sometimes employed a man for this sole purpose. It is ever to be kept in mind, that it is only when made to stand or stagnate on the ground, that water operates to advantage: But whether this be by depositing on the soil such rich particles, as make the immediate food of plants, or by dissolving and macerating it; or, which is most probable, by both these means, it is not necessary here to determine. Indeed Mr S. is inclined to think, that it excites a proper fermentation, and the softness which the soil thereby acquires and preserves for a considerable time after, together with some other circumstances, seem to favour the supposition.

While

While the ground is under water, and even for some days after it is laid dry, no cattle of any kind should be allowed to set foot on it. The water should be withdrawn rather gradually; as otherwise, at least in a dry season, the grass will be a little apt to decay. There is no striking difference between the effects of water which runs from pools, or soft water of any kind, and those of hard water immediately from the spring. The former is no doubt preferable, but the latter will serve the purpose very well; and this seems to be agreeable to the experiments of Dr Home.—Such is the method of watering land, which Mr S. has followed with great success for nearly the space of fifty years. There is one inclosure of his which, by this management, was brought from an exhausted state into good heart, and preserved an uncommon degree of fertility for a succession of crops, (one of them wheat), without fallow, lime, or marle, and with very moderate assistance from dung.

With respect to the subject in general, it may be observed, that water not only serves to enrich the land for future crops of corn, but also generally secures an early and a large crop of grass the year in which it is applied, a matter of considerable importance, especially in a dry and backward spring. Perhaps the only inconveniency attending it is its encouraging weeds of a certain kind, such as thistles, ragweed, &c. but this appears to be fully balanced by the destruction it occasions to weeds of another kind, such as commonly infest dry lands, but never thrive in water.

F I N I S.

